

## Impacts of Declining Demand

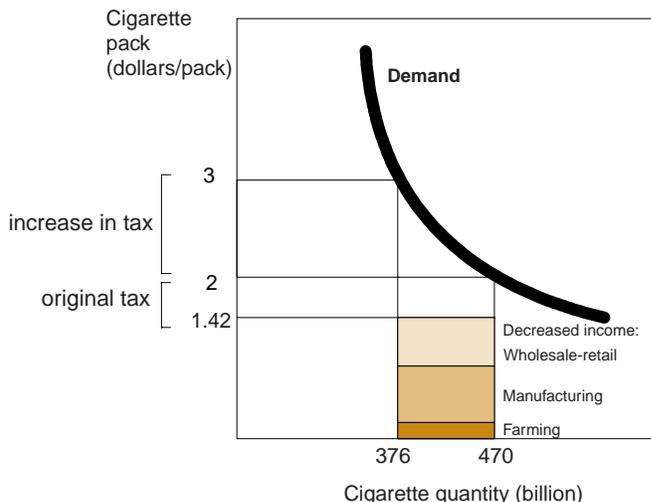
If recent trends continue, domestic demand for cigarettes will likely fall 17 percent from 1998 to 2008. If cigarette exports remain constant, this would amount to a decline in total demand (domestic and foreign) for U.S. cigarettes of 13 percent over the 1998-2008 period. As expenditures on tobacco products fall, the demand for workers, capital, land, and other factors used in the production and distribution of tobacco will fall. Demand will expand in other sectors as consumers shift spending away from tobacco products to other goods and services or tax payments.

To illustrate this process, we provide a simple analysis of the impacts of a \$1-per-pack increase in cigarette excise taxes on revenue and employment in various sectors of the economy. The effect of price increases tied to tobacco settlement liabilities would be similar. The 1998 data shown earlier in table 2 are used as the basis for the calculations, assuming an initial price per pack of \$2 (including excise taxes of \$.58) and initial consumption of 470 billion cigarettes. To simplify the analysis, we assume no changes in exports, tobacco leaf prices, and proportions of domestic and imported leaf used in cigarettes. There is much uncertainty about how these variables will change over time. The actual process would occur over a number of years and would be more complex than described below. The purpose is to provide a rough gauge of how large the effects might be.

If a \$1-per-pack increase in excise tax from \$.58 to \$1.58 were passed on to smokers, it would raise the average retail price of a pack to \$3, a 50-percent increase. Using elasticities of demand in the range of -0.4 to -0.5, this implies that consumer purchases of cigarettes would decline by 20 to 25 percent (table 5).<sup>6</sup> Total spending on cigarettes would rise by \$5.9 billion if the elasticity is -0.5 or \$9.4 billion if the elasticity is -0.4. Government revenues (through tax collections or industry settlement payments) would rise \$15.6 to \$13.7 billion. Gross revenue to the tobacco sector (net of taxes) would fall by \$6.2 billion to \$7.8 billion (the shaded areas in fig. 3). If we assume that the various sectors maintain a constant share of the cigarette dol-

<sup>6</sup> "Estimates of the retail price elasticity of demand for cigarettes range from -0.28 to -0.80, with most clustering between -0.40 and -0.75." (Brown, Snell, and Tiller) Earlier studies have generally used elasticities in the range of -0.40 to -0.50, but a recent study by Becker, Grossman, and Murphy estimated a longrun elasticity of -0.75.

Figure 3  
Effects of a \$1 excise tax increase on demand for tobacco products



Note: Cigarette prices are per pack of 20. Analysis assumes that excise taxes are passed on fully to consumers. Wholesale-retail, manufacturing, and farming are assumed to maintain equal shares of tobacco revenues.

lar, then wholesale, retail, and transportation businesses (as measured in table 2), would lose \$1.5 billion to \$1.9 billion of income and manufacturers would lose \$3.9 billion to \$4.9 billion. This assumes that cigarette exports remain stable and prices net of taxes remain constant. If manufacturers decrease their demand for U.S. and imported leaf proportionally, and if leaf prices do not change, a decline in purchases of U.S. leaf in the range of \$212 to \$265 million would result (the dark-shaded area in fig. 3). Assuming that leaf exports do not change, this would amount to a 7- to 9-percent decrease in gross receipts. The percentage decline in farm income is much less than the percentage decline in domestic cigarette purchases because we have assumed that exports of cigarettes and leaf do not change.

## Impacts on Businesses and Employment

We analyzed these changes in tobacco revenues with an input-output model of the U.S. economy to estimate the magnitude of employment impacts. We report these employment impacts to provide an indication of how many workers may be adversely affected by a decline in tobacco production. Sectors that are the recipients of government spending may create additional jobs to offset the job losses shown below. (Increased tax revenues may support additional government spending, reduce government borrowing, or

**Table 5—Effects of a \$1 increase in cigarette price**

Variable	Unit	Low	High	Assumptions
Price change:				
per pack	Dollars	1	1	Entire tax passed on to consumers
percentage change (retail)	Percent	50.0	50.0	
Elasticity of demand	NA	-.4	-.5	
Change in U.S. demand for cigarettes	Percent	-20.0	-25.0	
Change in:				
Consumer expenditures	Bil. doll.	9.4	5.9	
Tax revenue	Bil. doll.	15.6	13.7	
Tobacco sector gross income	Bil. doll.	-6.2	-7.8	Price net of tax assumed constant
Wholesale, retail	Bill. doll.	-1.5	-1.9	1996 share of sector receipts constant
Manufacturing receipts	Bill. doll.	-3.9	-4.9	Exports, price (net of tax) assumed constant
Domestic tobacco farms	Mil. doll.	-212.4	-265.4	1996 share of sector receipts constant, leaf prices constant, import share constant
Employment effects	1,000 jobs	-74.7	-96.8	Estimated with input/output model
Employment by sector:				
Agriculture	1,000 jobs	-11.6	-15.1	
Mining and construction	1,000 jobs	-1.4	-2.0	
Tobacco manufacturing	1,000 jobs	-4.6	-5.9	Assumed 1996 ratio of employment to output
Other manufacturing	1,000 jobs	-9.7	-12.8	
Transportation, communications, public utilities	1,000 jobs	-2.8	-3.7	
Retail, wholesale, transportation	1,000 jobs	-34.3	-43.4	
Services and other	1,000 jobs	-10.4	-13.9	

Source: Calculated by ERS using 1997 data from *Tobacco Situation and Outlook*, table 2, and IMPLAN input/output analysis.

allow reductions in other taxes.) Warner et al., Gale (1997b), and Irvine and Sims (for Canada) have used this approach to show that there would be very little net change in employment due to a shifting of tobacco expenditures to other industries.<sup>7</sup> There are, however, important shortrun adjustments for vulnerable regions, businesses, and workers; and regions are affected disproportionately. New jobs created by diverting tobacco dollars to other sectors are thinly distributed around the country (depending largely on how governments decide to spend excise tax revenues), while losses are heavily concentrated in tobacco growing and manufacturing areas of the Southeast (Warner et al.).

A \$1 increase in cigarette excise taxes could affect an estimated 74,700 to 96,800 jobs (table 5). These jobs include workers directly involved in the tobacco sup-

ply chain (farming, manufacturing, distribution, storage, and sales), as well as workers in supporting industries that supply the tobacco industry with inputs and materials. About 5,000 jobs might be lost in tobacco manufacturing, including tobacco stemming and redrying. (Cigarette manufacturers have already cut employment in recent years through early retirements and layoffs.) A cut in production of this magnitude could result in the closure of one or more manufacturing plants, as manufacturers consolidate production in the most up-to-date and productive plants and move some export production offshore. Manufacturers have claimed that large industry payments specified in proposed comprehensive tobacco legislation could push one or more companies into bankruptcy. Other manufacturing industries, including those that supply paper, packaging, chemicals, equipment, and machinery to the tobacco industry, might lose 9,700 to 12,800 jobs.

The model suggests that 11,600 to 15,100 farming jobs would be lost, but it is difficult to precisely estimate employment impacts on farming. Most tobacco farming jobs are part-time, and much of the decline in tobacco production would be achieved by tobacco farmers' retir-

<sup>7</sup>An important aspect of declining cigarette consumption not considered in these studies is complementarity between cigarettes and other goods and services, which would cause expenditures on related products to decline along with cigarettes. Moore, for example, found evidence of complementarity between smoking and beer consumption. Opponents of smoking restrictions have argued that eating and drinking establishments suffer significant loss of business due to restrictions on smoking in public places.

ing or switching to other farm enterprises. The largest share of jobs affected would be in the 34,300-43,400 retail and wholesale establishments that sell tobacco products. Retail activity is distributed widely across the country in proportion to the number of smokers in each locality. California has the highest cigarette sales (measured in packs), followed by Texas, Florida, Ohio, New York, and Pennsylvania. Wholesale activity is also widely distributed. Service establishments, including those in business, financial, and personal services, would also have at least 10,000 jobs affected.

## Farm Impacts

Under current policy, decreases in demand for U.S. tobacco are transmitted to the tobacco farm sector by cutting tobacco quotas, while prices are maintained at relatively high levels. The tobacco price support is determined largely by an average of past years' prices and a cost-of-production index, which keeps it from falling rapidly in response to demand changes. As demand for tobacco products falls, manufacturers submit lower purchase intentions for tobacco leaf, which figure prominently into the formula for setting annual tobacco quota.<sup>8</sup> Each individual's quota is then decreased proportionally. Maintaining the price of tobacco at a relatively high level keeps the returns to growing tobacco (and consequently the value of a tobacco quota) high. Since there is no price signal to induce resources to exit tobacco production, quotas are cut to prevent surpluses from accumulating. As a result, the loss of production and income is more or less spread proportionally across all producers and regions.

Brown and Martin found that responding to decreased demand by cutting price supports could result in less income loss to tobacco-growing areas than would a policy of cutting quotas and maintaining the price support at a high level. The key assumption in Brown and Martin's analysis is that a lower price would increase export demand for U.S. leaf, partly offsetting lost domestic demand.

A lower tobacco price is undesirable for owners of quota, because quota lease rates would fall. However, reducing the amount of tobacco quota increases quota lease rates. Restricting the number of pounds of quota, while keeping its per-pound value constant, drives up

the price, or lease rate, of quota. Thus, quota owners would prefer that falling tobacco demand be met by decreases in quota rather than decreases in the price support. Brown and Martin conclude that growers who rent most of their quota would fare better under a policy of allowing the price support to fall, while growers who own most of their quota would benefit from maintaining the price support and cutting quotas to absorb a decline in demand.

Brown and Martin conclude that it is unlikely that the tobacco legislation would be changed to allow price supports to decline in response to shrinking demand. In the current political environment, elimination of the tobacco program altogether seems more likely than changes in the parameters of the program. Elimination of the program could have greater impact on the tobacco industry than would most other policy changes. Removal of price supports and quota restrictions on production and marketing of tobacco would result in increased tobacco production and lower prices (Brown, 1997, 1998; Brown, Snell, and Tiller, 1999; Gardner, 1997; Sumner and Alston, 1985). Owners of tobacco quota would lose quota rental income (if they rent their quota to others) or experience lower net farm income (if they use quota to grow tobacco themselves). However, elimination of the program could include compensation to quota owners. (Buyouts of tobacco quota were included in several proposals for comprehensive tobacco legislation considered by Congress in 1998.) Without the program, many small, high-cost growers would no longer be competitive; but low-cost producers would remain in the sector and expand their tobacco acreage to spread their fixed costs over a larger number of tobacco acres (thus reducing costs per unit of output). U.S. farmers could produce considerably more tobacco if they were not constrained by quotas and the program's requirement that only half of a farm's tillable acreage can be planted in tobacco. However, in many areas, a lack of curing barns and labor would be constraints to expansion. In the long run, tobacco production would likely shift to eastern North and South Carolina and southern Georgia, where capacity for expanding tobacco acreage is particularly large (Brown, 1997; Sumner and Alston, 1985). A later section of this report uses national survey data on tobacco farms to illustrate the differences among regions

Gardner's analysis of the elimination of the tobacco program concludes that tobacco production would rise 8 percent and the price of tobacco leaf would fall 18

<sup>8</sup>For example, following the announcement of the November 1998 settlement and a 50-cent increase in wholesale prices, most manufacturers reported steep decreases in purchase intentions in anticipation of slower domestic sales.

cents per pound (9 percent). Consistent with the Brown and Martin analysis, Gardner anticipates that most of the added production would be exported. Domestic tobacco could also displace some imported leaf in cigarette production if the price fell. Sumner and Alston's earlier study found similar but much larger effects, which Gardner attributes to the higher levels of support provided by the tobacco program during the early-1980's period when the Sumner-Alston work was done. The net effect on burley production of eliminating the tobacco program is uncertain, but flue-cured production could increase 40 to 50 percent (Brown, 1998). Previous work indicates that demand

for flue-cured tobacco is more responsive to price changes than is demand for burley tobacco (Brown, Snell, and Tiller). Thus, if tobacco price supports were removed, demand for flue-cured tobacco would increase substantially, while demand for burley tobacco would rise only modestly. Total gross income to flue-cured farmers would rise (production would likely rise enough to offset the decline in price), while gross income to burley growers would fall. The negative impact of program elimination would fall largely on owners of quota, while income to growers who rent all of their quota would rise. (They would no longer need to pay for quota.)